DIS2011

Electroweak Physics and Beyond the Standard Model
Parallel Session I, Tuesday 12th of April 2011, 9:00-10:45

Title: Constraining new physics using Tevatron's Higgs exclusion limits
Radja Boughezal (ANL)
The null search for the Higgs boson at the Tevatron implies strong constraints on heavy colored particles that increase the gluon-fusion induced production rate of the Higgs. In this talk, we discuss the implications of the Tevatron exclusion limit on example extensions of the Standard Model that contain a new scalar state transforming as either an adjoint or a fundamental under the QCD gauge group.

Title: Search for the SM Higgs boson in ppbar collisions at D0
Maiko Takahashi
We present searches for the standard model Higgs boson in proton-antiproton collisions at a center-of-mass energy of 1.96 TeV using up to 7.3 /fb of data collected with the D0 detector at the Fermilab Tevatron collider. The search covers the main Higgs boson production mechanisms, gluon fusion (gg\to H), associated production (WH, V=W,Z) and vector boson fusion (qq-bar to H), as well as the main decay modes (H to bb-bar, H to tautau, H to WW to llnunu, lnujj, H to ZZ to lljj and H to gamma+gamma). We present an upper limit on Higgs production obtained using all available search channels, which results in an exclusion of the SM Higgs boson in a region around MH = 160 GeV. We also interpret the results of these searches in the framework of 4th generation models.

Title: Search for the MSSM Higgs boson in ppbar collisions at D0
Per Jonsson
We present searches for Higgs bosons (phi) in the framework of MSSM models using up to 7.3 /fb of data collected with the D0 detector in proton-antiproton collisions at a center of mass energy of 1.96 TeV at the Fermilab Tevatron collider. Within the MSSM the production of the Higgs boson can be significantly enhanced compared to the standard model and there is a significant branching ratio to 3rd generation fermions (pairs of b quarks and tau leptons) at all masses. In addition to the gluon fusion (gg to phi), we also investigate the associated production with a b quark (bg to b+phi) and present results for final states involving 3 or 4 b-jets, tau pairs and tau pairs produced in association with a b-quark. We interpret our results in the framework of the MSSM. In addition we discuss searches for a fermiophobic Higgs boson and NMSSM Higgs bosons.

Title: Boosting BSM Higgs discovery
Adam Martin (Fermilab)
In this talk I will present a method to discover the Higgs boson in new physics event samples at the LHC. The method makes use of boosted kinematics, b-tagging and jet substructure. The requirements of new physics are quite general: there must be features in the new physics event sample which allow a clean separation from standard model background, and there should be Higgs bosons produced in association with the new physics. I will show how this method

superbly finds and identifies the lightest Higgs boson in the minimal super-symmetric standard model and in extensions of the standard model containing new, vector-like quarks.

Title: Higgs boson searches (SM and MSSM) with ATLAS
Nicolas Moeser (Universitaet Bonn)
The search for the Standard Model-like Higgs boson over a wide mass region and in multiple channels is presented, based on the ATLAS data collected in 2010. The combination of these channels is also shown. In the area of MSSM Higgs bosons, new exclusion limits and exploratory studies are presented. These searches give sensitivity to various theoretical predictions which surpasses anything previously available.